

# MIRKO MAZZOLENI'S CURRICULUM VITAE

UPDATED: 12 AUGUST 2024

## CURRENT POSITION

**Fixed-term Assistant professor (RTD-B)** **November 2021 - Today**

Italian qualification for associate professorship (ASN), GSD 09/IINF-04 Automatica, SSD IINF-04/A Automatica, obtained on November 2023.

DIPARTIMENTO DI INGEGNERIA GESTIONALE, DELL'INFORMAZIONE E DELLA PRODUZIONE, UNIVERSITÀ DEGLI STUDI DI BERGAMO, ITALY

## PREVIOUS POSITIONS

**Fixed-term junior Assistant professor (RTD-A)** **October 2019 - November 2021**

DIPARTIMENTO DI INGEGNERIA GESTIONALE, DELL'INFORMAZIONE E DELLA PRODUZIONE, UNIVERSITÀ DEGLI STUDI DI BERGAMO, ITALY

**Post-doctoral fellow** **March 2018 - October 2019**

DIPARTIMENTO DI INGEGNERIA GESTIONALE, DELL'INFORMAZIONE E DELLA PRODUZIONE, UNIVERSITÀ DEGLI STUDI DI BERGAMO, ITALY

## INDUSTRIAL RESEARCH ACTIVITY

**R&D Electronic - Software Engineer Internship** **February 2014 - August 2014**

SAME DEUTZ FAHR GROUP

Developing diagnostic software for ECU in automotive field with the C programming language, using the CAN and UDS protocols. Performing integration and beta testing on the diagnostic functionalities of the machine.

## EDUCATION

**Ph.D. in Engineering and Applied Sciences** **October 2014 - October 2017**

UNIVERSITÀ DEGLI STUDI DI BERGAMO, ITALY

Thesis title: "Learning meets control: data analytics for dynamical systems" (in English)

Advisor: Prof. Fabio Previdi, Grade: High

Reviewers: Prof. Michel Verhaegen (TU Delft, The Netherlands), Prof. Simone Garatti (Politecnico di Milano, Italy)

**Master of Science in Computer Engineering** **September 2011 - March 2014**

UNIVERSITÀ DEGLI STUDI DI BERGAMO, ITALY

Thesis title: "Fault detection and isolation for electromechanical actuators in aerospace application using pattern recognition methods" (in English)

Advisor: Prof. Fabio Previdi (in collaboration with UmbraGroup S.p.A.), Grade: *110/110 summa cum laude*

**Bachelor of Science in Computer Engineering** **September 2009 - December 2011**

UNIVERSITÀ DEGLI STUDI DI BERGAMO, ITALY

Thesis title: "Controllo in LabView di un banco motore in CC simulato" (in Italian)

Advisor: Prof. Andrea Cataldo, Grade: *106/110*

## VISITING APPOINTMENTS

**January-February 2020 - (1 month)**

Visiting researcher at Department of Mechanical Engineering - Control Systems Technology, Eindhoven University of Technology (host: Prof. Tom Oomen).

## ACADEMIC RESEARCH ACTIVITY

### 1. System identification algorithms

In the last decade, a cross-fertilization began between the System Identification and the Statistical Learning communities. This led firstly to the introduction of regularization techniques in system identification, and, more recently, to the application of kernel methods to dynamical systems learning. These ideas immediately became state-of-art approaches for many system identification tasks. Following this rationale, this line of research aims to leverage methodologies born under the machine learning light and employing them for system identification cause. This could also lead to new ideas and rich debate between different researchers. Methodological extensions in this area include:

- Non parametric kernel methods for system identification using semi-supervised techniques [J11] [J08] [J05] [J02] [C24] [C22] [C21] [C19] [C17] [C12] [C11] [B01] [T01];

- Non parametric kernel methods for continuous-time system identification [J06] [C25];
- Other methods [C27] [C20] [C38];
- Robust control [J13].

## 2. Fault diagnosis and condition monitoring algorithms

Fault diagnosis is an established field of control systems. However, due to the intrinsic characteristics of the processes being monitored, fault detection and health monitoring methodologies need to be adapted for the particular problem at hand. The aim of this research area is to develop fault detection and condition assessment algorithms for industrial applications, mainly via data-driven or signal-based techniques, drawing from fields such as statistics, machine learning and system identification. This field has nowadays received increased attention under various synonyms such as predictive maintenance, and it is expected to be even more important with the widespread of sensor technologies. The research activity in this area is specifically focused on:

- Fault detection and condition monitoring of electro-mechanical actuators in aerospace environment [J14] [J04] [J03] [B02] [C18] [C15] [C14] [C13] [C08] [C07] [C06] [C01];
- Maintenance of industrial machines [J19] [J16] [J12] [C31] [C29] [C28] [C26] [C18] [C03] [C35] [C37];
- Other supervision applications [J18] [C36] [C30] [C39] [C41].

## 3. Other research activities (with at least one publication)

- Sentiment analysis [C10];
- Modeling and control of mechanical systems [C05] [C04] [C23] [C34] [C40];
- Business analytics [C09];
- Application of machine learning and data science [J01] [J15] [J07] [J09] [J10] [C16] [C02];
- Optimization [J17];
- Artificial Pancreas [C32].

## TEACHING ACTIVITY

### Lecturer

Course:	Advanced methods for system identification (in English) <b>Ph.D. course</b>
Academic Year:	2023/2024
Ph.D. Program:	Engineering and Applied Sciences
Class Hours:	<b>8</b>
University:	Università degli Studi di Bergamo
Course:	Adaptive Learning, Estimation and Supervision of dynamical systems (in English) M.Sc. course
Academic Year:	2023/2024
Class Hours per Year:	<b>48 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo
Course:	Model Identification and Data Analysis (in Italian) M.Sc. course
Academic Year:	2023/2024
Class Hours per Year:	<b>48 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo
Course:	Management, Analysis and Representation of Data (in Italian) B.Sc. course
Academic Year:	2023/2024
Class Hours per Year:	<b>24 - 3 c.f.u.</b>
University:	Università degli Studi di Bergamo
Course:	Laboratory Sustainable Industrial Systems (in English) M.Sc. course
Academic Year:	2022/2023
Class Hours per Year:	<b>24 - 3 c.f.u.</b>
University:	Università degli Studi di Bergamo
Course:	Adaptive Learning, Estimation and Supervision of dynamical systems (in English) M.Sc. course
Academic Year:	2022/2023
Class Hours per Year:	<b>48 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo
Course:	Model Identification and Data Analysis (in Italian) M.Sc. course
Academic Year:	2022/2023
Class Hours per Year:	<b>48 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo

---

Course:	Methods of fault diagnosis (in English) <b>Ph.D. course</b>
Academic Year:	2021/2022
Ph.D. Program:	Engineering and Applied Sciences
Class Hours:	<b>12</b>
University:	Università degli Studi di Bergamo
Course:	Advanced methods for system identification (in English) <b>Ph.D. course</b>
Academic Year:	2021/2022
Ph.D. Program:	Engineering and Applied Sciences
Class Hours:	<b>20</b>
University:	Università degli Studi di Bergamo
Course:	Digital technologies for the services - data science (in Italian) <b>Master</b>
Academic Year:	May - June 2022
School:	Servitization nel settore automotive
Class Hours:	<b>8</b>
University:	Università del Piemonte Orientale
Course:	Dynamic Systems Identification (in English) M.Sc. course
Academic Year:	2021/2022
Class Hours per Year:	<b>12 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo
Course:	Control systems Engineering (in Italian) B.Sc. course
Academic Year:	2021/2022
Class Hours per Year:	<b>16 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo
Course:	Model Identification and Data Analysis (in Italian) M.Sc. course
Academic Year:	2021/2022
Class Hours per Year:	<b>32 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo
Course:	Data science and automation (in English) M.Sc. course
Academic Year:	2021/2022
Class Hours per Year:	<b>32 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo

---

Course:	Applicazioni di predictive maintenance in ambito industriale (in Italian) <b>Master</b>
Academic Year:	16 October 2020
School:	SdM School of Management, Master Fabbrica Intelligente
Class Hours:	<b>4</b>
University:	Università degli Studi di Bergamo
Course:	Introduzione all'intelligenza artificiale, machine learning e data science (in Italian) <b>Master</b>
Academic Year:	18 January 2020
School:	SdM School of Management, Master Fabbrica Intelligente
Class Hours:	<b>4</b>
University:	Università degli Studi di Bergamo
Course:	Machine Learning in Advanced Manufacturing (in English) <b>Summer school</b>
Academic Year:	2020/2021
School:	China-Italy Lab on Advanced Manufacturing (CI-LAM)
Class Hours:	<b>3</b>
University:	Università degli Studi di Bergamo (virtual)

Course:	Advanced methods for system identification (in English) <b>Ph.D. course</b>
Academic Year:	2020/2021
Ph.D. Program:	Engineering and Applied Sciences
Class Hours:	<b>20</b>
University:	Università degli Studi di Bergamo (virtual)
Course:	Forecasting and learning for dynamic decision-making (in English, co-taught with M. Tanelli, S. Formentin, V. Breschi) <b>Ph.D. course</b>
Academic Year:	2020/2021
Ph.D. Program:	Data analytics and decision sciences
Class Hours:	<b>1</b>
University:	Politecnico di Milano (virtual)
Course:	Model Identification and Data Analysis (in Italian) M.Sc. course
Academic Year:	2020/2021
Class Hours per Year:	<b>48 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo
<hr/>	
Course:	Advanced methods for system identification (in English) <b>Ph.D. course</b>
Academic Year:	2019/2020
Ph.D. Program:	Engineering and Applied Sciences
Class Hours:	<b>20</b>
University:	Università degli Studi di Bergamo (virtual)
Course:	Model Identification and Data Analysis (in Italian) M.Sc. course
Academic Year:	2019/2020
Class Hours per Year:	<b>48 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo
Course:	Data science and automation (in English) M.Sc. course
Academic Year:	2019/2020
Class Hours per Year:	<b>32 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo
Course:	Model Identification and Data Analysis (in Italian) M.Sc. course
Academic Year:	2019/2020
Class Hours per Year:	<b>32 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo
<hr/>	
Course:	Model Identification and Data Analysis (in Italian) M.Sc. course
Academic Year:	2018/2019
Class Hours per Year:	<b>48 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo
Course:	Model Identification and Data Analysis (in Italian) M.Sc. course
Academic Year:	2017/2018
Class Hours per Year:	<b>48 - 6 c.f.u.</b>
University:	Università degli Studi di Bergamo
<b>Tutorial classes</b>	
Course:	Dynamic system identification (in English) M.Sc. course - Teacher: Prof. A. Ferramosca
Academic Year:	2020/2021
Class Hours per Year:	<b>12</b>
University:	Università degli Studi di Bergamo
Course:	Control System Engineering (in Italian) M.Sc. course - Teacher: Prof. M. Ermidoro
Academic Year:	2016/2017
Class Hours per Year:	<b>12</b>
University:	Università degli Studi di Bergamo

Course: Model Identification and Data Analysis (in Italian)  
 M.Sc. course - Teacher: Prof. S. Formentin  
 Academic Year: 2014/2015 - 2015/2016 - 2016/2017  
 Class Hours per Year: **12 - 12 - 12**  
 University: Università degli Studi di Bergamo

### Industrial and other classes

Course: Machine learning and IoT for predictive maintenance from a sustainable perspective (in Italian)  
 Year: April-May 2024  
 Class Hours: **16**  
 Company: Confindustria Veneto SIAV s.r.l. Predittività  $\frac{1}{2}$  e servitizzazione: fattori abilitanti della sostenibilità  $\frac{1}{2}$  - 107

Course: A practical introduction to Artificial Intelligence (in Italian)  
 Year: January 2024  
 Class Hours: **15**  
 Company: Consorzio TCN s.r.l.

Course: Predictive maintenance (in Italian)  
 Year: April 2022  
 Class Hours: **32**  
 Company: SALF s.p.a.

Course: Fondamenti di automatica (in Italian)  
 Year: February-March 2022  
 Class Hours: **30**  
 Company: Istituto Tecnico Superiore (I.T.S.) Lombardia Meccatronica.

Course: Data science (in Italian)  
 Year: September 2021  
 Class Hours: **24**  
 Company: SMI group s.p.a.

Course: Fondamenti di automatica (in Italian)  
 Year: April-May 2021  
 Class Hours: **30**  
 Company: Istituto Tecnico Superiore (I.T.S.) Lombardia Meccatronica.

Course: A practical introduction to Artificial Intelligence (in Italian)  
 Year: March 2021  
 Class Hours: **16**  
 Company: Consorzio TCN s.r.l.

Course: Statistical signal analysis (in Italian)  
 Year: November 2020  
 Class Hours: **16**  
 Company: Consorzio TCN s.r.l and FCA group.

Course: Big data and machine learning (in Italian)  
 Year: November 2020  
 Class Hours: **24**  
 Project: Veneto region project A.G.E.: "Apprendimento, Generazioni, Evoluzione",  
 Cod. Prog.: 2749-0001-1315-2019  
 Company: Eduforma s.r.l and A&M Projects s.n.c.

Course: Fondamenti di automatica (in Italian)  
 Year: June-July 2020  
 Class Hours: **30**  
 Company: Istituto Tecnico Superiore (I.T.S.) Lombardia Meccatronica.

Course: A practical introduction to Artificial Intelligence (in Italian)  
 Year: September 2019  
 Class Hours: **16**  
 Company: Consorzio TCN s.r.l.

Course: A practical introduction to Artificial Intelligence (in Italian)  
 Year: January 2019  
 Class Hours: **16**  
 Company: Consorzio TCN s.r.l.

### Ph.D. Theses Advisor or Co-Advisor

- *Surrogate-based methods for black-box and preference-based optimization in control systems*, Ph.D. program in Engineering and Applied Sciences, Università degli Studi di Bergamo. Student: D. Previtali, February

2023.

- *Data-driven robust control and diagnosis: Theory and Application*, Ph.D. program in Engineering and Applied Sciences, Università degli Studi di Bergamo. Student: N. Valceschini, February 2023.
- *Regularized kernel-based learning for system identification*, Ph.D. program in Engineering and Applied Sciences, Università degli Studi di Bergamo. Student: M. Scandella, November 2019.
- *Health Monitoring of Electro-Mechanical Actuators for primary flight surfaces*, Ph.D. program in Engineering and Applied Sciences, Università degli Studi di Bergamo. Student: Y. Maccarana, September 2018.

#### M.Sc. Theses Advisor or Co-Advisor

- *Data selection algorithms in adaptive system identification and fault diagnosis*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: F. Corrini. Academic Year: 2023/2024.
- *Development and Implementation of an Integrated Condition Monitoring System for Industrial Maintenance*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: G. Cantoni. Academic Year: 2023/2024.
- *Controller Redesign Methods for Fault-Tolerant Control*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: T. Foster. Academic Year: 2022/2023.
- *Evaluation of CNN models for the aerial image detection: an approach with zero/one-shot and few-shot techniques learning*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: E. Toffolatti. Academic Year: 2022/2023.
- *Identificazione di sistemi dinamici con metodi kernel e tecniche di graph learning*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: P. Boni. Academic Year: 2021/2022.
- *Diagnosi robusta dei guasti tramite approcci model-based e applicazione ad un attuatore aerospaziale*, M.Sc. program in Mechanical Engineering, Università degli Studi di Bergamo. Student: D. Crippa. Academic Year: 2020/2021.
- *Mixed-sensitivity oriented regularization for linear system identification*, M.Sc. program in Management Engineering, Università degli Studi di Bergamo. Student: G. Vedovati. Academic Year: 2020/2021.
- *Progettazione di un metodo di rilevazione dei guasti con approccio data-driven basato su identificazione ai sottospazi (in Italian)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: G. Viganò. Academic Year: 2020/2021.
- *Diagnosi di guasti per cuscinetti a sfera con metodi di Compressed Sensing (in Italian)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: N. Belotti. Academic Year: 2019/2020.
- *Modellistica e diagnosi dei guasti di un attuatore elettromeccanico per superfici secondarie di controllo del volo (in Italian)*, M.Sc. program in Mechanical Engineering, Università degli Studi di Bergamo. Students: E. Jacobelli, A. Cordoni. Academic Year: 2019/2020.
- *Metodi di riduzione dimensionale per la stima non parametrica e per la classificazione di particelle leggere (in Italian)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: G. Dantoni. Academic Year: 2018/2019.
- *Sviluppo e validazione sperimentale di algoritmi di manutenzione predittiva per macchine soffiatrici (in Italian)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: J. Ghisalberti. Academic Year: 2018/2019.
- *Sviluppo e validazione di un metodo di diagnosi e monitoraggio dei guasti per centri di lavoro ad alte prestazioni (in Italian)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: L. Pitturelli. Academic Year: 2018/2019.
- *Sviluppo sperimentale di un metodo model-based di diagnosi dei guasti per attuatori elettromeccanici in ambito aerospaziale (in Italian)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: S. Giusso. Academic Year: 2018/2019.
- *Identificazione e sintesi di Dynamic Texture attraverso approcci data-driven (in Italian)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Students: D. Previtali, N. Valceschini. Academic Year: 2018/2019.
- *Algoritmi di Health Monitoring per la manutenzione predittiva di attuatori elettromeccanici di aeromobili (in Italian)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: A. Russo. Academic Year: 2017/2018.

- *Modeling and identification of a hydraulic thermoforming press for advanced parallelism control (in English)*, M.Sc. program in Mechanical Engineering, Università degli Studi di Bergamo. Student: L. Covelli. Academic Year: 2017/2018.
- *Identificazione Semisupervisionata per modelli NARX (in Italian)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: G. Bergamelli. Academic Year: 2016/2017.
- *Progettazione e sviluppo di un software per l'archiviazione e l'interrogazione di dati genetici (in Italian)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: V. Uberti, A. Hu. Academic Year: 2016/2017.
- *Identificazione Semisupervisionata di modelli N-FIR (in Italian)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: M. Scandella. Academic Year: 2015/2016.
- *Sviluppo di un algoritmo non supervisionato per l'estrazione delle emozioni fondamentali da dati testuali (in Italian)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: G. Breviario. Academic Year: 2015/2016.
- *Modeling, identification and control of a test bench for fault detection of aeronautical electro-mechanical actuators (in English)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: Y. Maccarana. Academic Year: 2014/2015.
- *Recommender systems for digital magazines: algorithms analysis and design (in English)*, M.Sc. program in Computer Engineering, Università degli Studi di Bergamo. Student: D. Servalli. Academic Year: 2014/2015.

#### ACADEMIC ROLES

- Member of the department team following the European Factories of the Future Research Association (EFFRA) activities (2024-Today).
- Delegate of the department for the curriculum counseling for new students of the Computer Engineering degree (2023-Today).
- President of the scientific committee of the engineering library (2022-Today).
- Member of the study committee of the Computer Engineering degree (2019-Today).

#### PARTICIPATION IN REGIONAL, NATIONAL AND INTERNATIONAL RESEARCH PROJECTS

- *KOIOS: Knowledge Extraction, Machine Learning and other AI approaches for secure, robust, frugal, resilient and explainable solutions in Defence Applications - EDF-2021-DIGIT-R-FL-KOIOS*  
 Period: 1/2022 - Today. (36 months)  
 Total budget: 9.98 M€ - UniBg budget: 353k€  
 Partners (14): CT Ingenieros aeronauticos de automocion e industriales sl (coordinator - Spain), Applied intelligence analytics (Ireland), Barcelona supercomputing centre - centro nacional de supercomputacion (Spain), Foundation fOr Research and Technology Hellas (Greece), Laboratoire national de metrologie et d'essais (France), Mitiga solutions sl (Spain), NTT data Spain (Spain), Office national d'etudes de recherches Aérospatiales (France), Stichting maritiem research instituut Nederland (Netherlands), Technische universiteit Eindhoven (Netherlands), Totalforsvarets forskningsinstitut (Sweden), Università degli Studi di Bergamo (Italy), Universitaet der Bundeswehr Muenchen (Germany), Vocapia (France).  
 Funded by: **European Union. European Defence Fund (EDF) 2021**. Call: EDF-2021-2021-DIGIT-R: Artificial intelligence. Topic title: EDF-2021-DIGIT-R-FL: Frugal learning for rapid adaptation of AI methods.  
 Role: **Principal Investigator** of the University of Bergamo activities.
- *ANTHEM: Advanced Technologies for Human-centred Medicine*  
 Period: 2022 - Today.  
 Total budget: 123M€ - UniBg budget: 900k€ca.  
 Funded by: **Italy Minister of University and Research (MUR)**. Piano Nazionale per gli investimenti complementari al PNRR (PNC0000003).  
 Role: **Principal Investigator of Pilot 1.1 (Leveraging data for clinical support systems and data management) of the Spoke 1 (Data and technology driven diagnoses and therapies)**. Joint responsibility of the Pilot 1.1 together with Fabio Stella (University of Milan-Bicocca) and Anna Caroli (Head of the Medical Imaging Laboratory of the Bioengineering Department, Istituto di Ricerche Farmacologiche Mario Negri IRCCS, Bergamo, Italy).
- *MOST: National center for sustainable mobility*  
 Period: 2022 - Today.  
 Funded by: **Italy National Recovery and Resilience Plan, Next Generation EU**. Piano Nazionale

Ripresa e Resilienza (PNNR).

Role: **Principal Investigator of WP 1.3 (User behaviours) of the Spoke 5 (Active mobility and light vehicles).**

- *SLIM: Smart Living in Manufacturing*  
Period: 2021 - Today.  
Funded by: **Regione Lombardia**. Program interventions for economic recovery.  
Role: Criticality identification and possible HW and SW solutions for sensor and virtual machine interfacing. Literature analysis for definition of problems and possible solutions within the scope industrial diagnostics for automated production lines.
- *REPRISE: Reliable Electro-mechanical actuator for PRImary Surface with health monitoring*  
Period: 7/2016 - 2021.  
Total budget: 995k€ - UniBg budget: 263k€  
Partners: Piaggio Aerospace s.p.a., UmbraGroup s.p.a., Zettlex I.t.d., Università degli Studi di Bergamo.  
Funded by: **European Union (H2020)** Clean Sky 2 Joint Technology Initiative.  
Role: Research in the Work Packages WP3 - Test Phase I; WP4 - Failure prevention technology selection.
- *HOLMES: Health On Line Monitoring for Electromechanical actuator Safety*  
Period: 1/2014 - 12/2016.  
Total budget: 490k€ - UniBg budget: 136k€  
Partners: Liebherr Aerospace GmbH, UmbraGroup s.p.a., Università degli Studi di Bergamo.  
Funded by: **European Union (FP7)** Clean Sky Joint Technology Initiative.  
Role: Research in the Work Packages WP4 - Modeling approach; WP5 - Realization of health monitoring software.
- *Health monitoring of an axis of an industrial CNC machining*  
Period: 06/2018 - 7/2019.  
Partners: Mandelli s.p.a., UmbraGroup s.p.a., Università degli Studi di Bergamo.  
Funded by: **Italian Ministry for the Economic Development (MiSE)**.
- *WATCHMAN: Workload-reduction machine vision-based Technology Hub for MANufacturing*  
Period: 02/2020 - 2022.  
Total budget: 6.601.061€ - UniBg budget: 1.106.000€  
Partners: Consorzio Intellimech, Brembo s.p.a., Fincons Group, Salf s.p.a. Laboratorio Farmacologico, Smart Robots s.r.l., SorintLab s.p.a., Università degli Studi di Bergamo, Vision s.r.l.  
Funded by: **Regione Lombardia**.  
Role: Investigation of the state of the art and implementation of machine vision algorithms for detecting faults in mechanical components.
- *SMART4CPPS: Smart Solutions for Cyber-Physical Production Systems*  
Period: 04/2018 - October 2020.  
Total budget: 7405k€ - UniBg budget: 694k€  
Partners: C.M.S. Costruzioni macchine speciali s.p.a., Ratti s.p.a., Scaglia Indeva s.p.a., Quantra s.r.l., Porta Solutions s.p.a., Cavagna Group (OMECA), Camozzi s.p.a., Balance Systems s.r.l., TXT e-Solutions s.p.a., Fincons s.p.a., Politecnico di Milano, Consiglio Nazionale delle Ricerche - Istituto di Tecnologie Industriali e Automazione, Università degli Studi di Bergamo, Università degli Studi di Brescia.  
Funded by: **Regione Lombardia**.  
Role: Research in the Pilot 1 - Design of Health monitoring algorithms for linear actuators and fluid valves.
- *ADAPTIVE: A modular and adaptive approach to the design of digital factories.*  
Period: 11/2015 - 01/2017.  
Total budget: 11.100k€  
Partners: Cosberg s.p.a., Scaglia Indeva s.p.a., Masmec s.p.a., Balluff Automation s.r.l., Copan Group s.p.a., Università degli Studi di Bergamo, Università degli Studi di Brescia, Consorzio Intellimech.  
Funded by: **Italian Ministry for the Instruction, University and Research (MIUR)**.  
Role: Development of manufacturing fault diagnostics methods using model-free and machine learning methodologies.
- *SMART LIVING 4 ALL: Improving safety at home for children and elderly*  
Period: 11/2017 - 5/2019.  
Total budget: 1237k€ - UniBg budget: 293k€  
Partners: ComfTech s.r.l., Mediaclinics s.r.l., Foppapedretti s.p.a., Università degli Studi di Bergamo.  
Funded by: **Regione Lombardia**.  
Role: Implementation of the crying analysis algorithm for babies with Tensorflow technology.
- *INTERNET OF BEAUTY: Products for customizable, intelligent, safe and ecological beauty-care*  
Period: 11/2017 - 5/2019.  
Total budget: 1125K€  
Partners: Tenacta Group s.p.a., FAE Technology s.p.a., Consorzio Intellimech, Università degli Studi di Bergamo.



Funded by: **Regione Lombardia.**

Role: Support for the development of prototypes and the algorithm for assigning appliance configuration parameters.

#### RESEARCH GRANTS OWNER

- *Leveraging uncertainty quantification for robust control and fault detection.* Funded by: Department of Management, Production and Information Engineering, University of Bergamo, 20.180,44 €, 2024.
- *New methods in system identification and control using machine learning techniques.* Funded by: Department of Management, Production and Information Engineering, University of Bergamo, 13.946,34 €, 2021.

#### EDITORIAL ACTIVITY

##### International journals

- Journal: *Actuators*. ISSN 2076-0825.  
Editor: MDPI.  
Special issue: Electro-Mechanical Actuator, Diagnostic and Fault-Tolerant Control Systems (2023).  
Website: [https://www.mdpi.com/journal/actuators/special\\_issues/Y3673DQDME](https://www.mdpi.com/journal/actuators/special_issues/Y3673DQDME)  
Role: Guest Editor.

##### International conferences

- *IEEE Control Editorial Board (CEB).*  
Period: Since August 2023.  
Role: Associate editor for IEEE Control Systems Society (CSS) conferences.
- *International Conference on Mechanics, Mechatronics, Materials and Civil Engineering 2022 (3MCE'2022).*  
Period: Tetouan, Morocco, September 10, 2022.  
Role: member of the scientific committee.

#### Reviews

I served as a reviewer for the journals *Automatica*, *Mechatronics*, *Control Engineering Practice*, *Engineering Applications of Artificial Intelligence*, *Computers in Industry*, *System and Control Letters*, *Medical Engineering and Physics*, *International Journal of Robust and Nonlinear Control*, *International Journal of Adaptive Control and Signal Processing*, *Optimal Control, Applications and Methods*, *IEEE Transactions on Automatic Control*, *IEEE Transactions on Industrial Electronics*, *IEEE Transactions on Instrumentation and Measurement*, *IEEE Control Systems Letters*, *IEEE Transactions on Control Systems Technology*, *Mechanical Systems and Signal Processing* and for several IFAC/IEEE conferences.

#### TECHNOLOGICAL TRANSFER ACTIVITIES

##### Industrial collaborations

- *Sensorization, acquisition and analysis of the characteristic signals of a specific polymer injection molding machine equipped with a specific mold, with particular reference to the cooling system of the mold itself,* within a research project between Università degli Studi di Bergamo and Lovato s.p.a. (Bergamo - BG, Italy), 2024. **Responsible of the research contract.**
- *Development of methods and algorithms for fault detection on components of a Tesmec stringing machine,* within a research project between Università degli Studi di Bergamo and Tesmec s.p.a. (Bergamo - BG, Italy), 2024. **Responsible of the research contract.**
- *Descriptive analysis of energy stringing machines for fault diagnosis,* within a research project between Università degli Studi di Bergamo and Tesmec s.p.a. (Bergamo - BG, Italy), 2023. **Responsible of the research contract.**
- *Enhancement of the control algorithms for an electro-mechanical actuator,* within a research project between Università degli Studi di Bergamo and Leonardo s.p.a. (La Spezia - SP, Italy), 2023. **Responsible of the research contract.**
- *Descriptive analysis of alarms and stop reasons for a shrinkwrapper machine,* within a research project between Università degli Studi di Bergamo and SmiGroup s.p.a. (San Giovanni Bianco - BG, Italy), 2022. **Responsible of the research contract.**
- *Leak detection algorithms for a smart valve prototype,* within a research project between Università degli Studi di Bergamo and Reetronics s.r.l. (Seriante - BG, Italy), 2022-Today. **Responsible of the research contract.**

- *Design of a control system for blood extractor devices*, within a research project between Università degli Studi di Bergamo and Delcon s.r.l. (Grassobbio - BG, Italy), 2020-Today.
- *Predictive Maintenance System for beverage packaging machines*, within a research project between Università degli Studi di Bergamo and SmiGroup s.p.a. (San Giovanni Bianco - BG, Italy), 2018-2020.
- *Evaluation of computational burden for CNC trajectory planning algorithms*, within a research project between Università degli Studi di Bergamo and DDX s.r.l. (Brembate Sopra - BG, Italy), 2018.
- *Development of a methodological procedure for tuning the control system of a thermoforming press*, within a research project between Università degli Studi di Bergamo and Persico s.p.a. (Nembro - BG, Italy), 2017.
- *Estimation of sliding gates mass using inertial sensors and motor measurements*, within a research project with Università degli Studi di Bergamo and BFT s.p.a. (Schio - VI, Italy), 2017.
- *Fault detection of strand ropes via image processing techniques*, within a research project between Università degli Studi di Bergamo and Vinati s.r.l. (Nave - BS, Italy), 2017.
- *Estimation of sliding gates position using inertial sensors*, within a research project between Università degli Studi di Bergamo and BFT a.p.a. (Schio - VI, Italy), 2016.
- *Technological scouting of range finder sensors*, within a research project between Università degli Studi di Bergamo and BFT s.p.a. (Schio - VI, Italy), 2016.
- *Advanced business analytics with system identification techniques*, within a research contract between Politecnico di Milano, E-Novia s.p.a. (Milan, Italy) and Pastificio Rana s.p.a. (Verona - Italy), 2015.
- *Development of a recommender system for digital kart articles*, within a research contract between University of Bergamo and E-Novia s.p.a. (Milan, Italy), 2015.
- *Development of drug craving therapy algorithm with brain-computer interfaces*, within a research contract between University of Bergamo and Relazione Impresa Sociale s.r.l. (Milan, Italy), 2015.

### Research contracts

- *Sviluppo di algoritmi di health monitoring per la manutenzione predittiva*, research project: SMART4CPPS, 2018.
- *Sviluppo preliminare di algoritmi per la change-point detection nell'ambito della diagnostica di guasti*, funded by: Centro di Ateneo per la Gestione dell'Innovazione e del Trasferimento Tecnologico (GITTT), Università degli Studi di Bergamo, 2018.
- *Support to the execution of the tests at Umbra Cuscinetti, Foligno*, research project: REPRISE, 2017.
- *Sviluppo di metodi di diagnostica model free con applicazione a dispositivi meccatronici*, research project: Adaptive and Modular Approaches for the Digital enabled factory, 2016.

### Entrepreneurial activity

- *Co-founder of the AISent S.r.l. company*. The company has the mission to create impactful solutions for the industry through technology. Website: <https://aisent.io/>, March 2018.

### SCIENTIFIC EVENTS

#### Invited talks

- *Nonparametric system identification with manifold regularization*. TIGRECO Workshop, PRIN 2022 project "Time-varying signals on graphs: real and complex methods", University of Bergamo, Bergamo, Italy, April 15, 2024.
- *Fault diagnosis strategies for the design and maintenance of industrial products*. Higher Polytechnic School University of Seville, Seville, Spain, October, 28 2021.
- *Designing diagnostic algorithms for reliable electromechanical flight actuators on more electric aircrafts*. VIII conference of R + D + i and V conference of the doctorate program in Installations and Systems for Industry (course 2021/22) Higher Polytechnic School, University of Seville, Seville, Spain, October 18, 2021.

### Organization

- Main organizer of the invited session "Intelligent Data-driven Fault Diagnosis, Prognostics and Health Aware Control" at the 22nd IFAC World Congress, Yokohama, Japan, 2023. Organizers: Mirko Mazzoleni, Silvio Simani, Mayank Shekhar Jha, Jacques Noom, Horst Schulte, Michel Verhaegen, Didier Theilliol.

### Presentation at international conferences/workshops

- 20th IFAC Symposium on System Identification (SYSID), 17-18 July, 2024, Boston, USA.
- 12th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes (SAFEPROCESS), Ferrara, Italy, June 4-7, 2024. **Winner (first place) of the competition “LiU-ICE Industrial Fault Diagnosis Benchmark”**. Team: Anselmi Nicholas, Andrea Arici, Francesco Corrini, Mirko Mazzoleni. Role in the team: supervision of the activities. Organizers of the competition: Daniel Jung, Erik Frisk, Mattias Krysander, Linköping University, Sweden.
- 19th IFAC Symposium on System Identification (SYSID), 2021 (virtual).
- 21st IFAC World Congress, 2020 (virtual).
- 17th EUCA European Control Conference (ECC), May 12-15, 2020 (virtual).
- 13th IFAC Workshop on Adaptive and Learning Control Systems (ALCOS), Winchester, UK, December 4-6, 2019.
- 27th ERNSI Workshop, Maastricht, The Netherlands, September 22-25, 2019.
- 57th IEEE Conference on Decision and Control (CDC), Miami Beach, Florida, December 17-19 2018.
- 26th ERNSI Workshop, Cambridge, UK, September 23-26, 2018.
- 2nd IEEE Conference on Control Technology and Applications (CCTA), Copenhagen, Denmark, 2018.
- 18th IFAC Symposium on System Identification (SYSID), Stockholm, Sweden, July 9-11, 2018.
- 26th Mediterranean Conference on Control and Automation (MED), Zadar, Croatia, June 19-22, 2018.
- 16th EUCA European Control Conference (ECC), Limassol, Cyprus, June 12-15, 2018.
- 3rd Nonlinear System Identification Benchmarks Workshop, Liege, Belgium, April 9-13, 2018.
- 20th IFAC World Congress, Toulouse, France, July 9-14, 2017.
- IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), Munich, Germany, July 3-7, 2017.
- 42nd IEEE Industrial Electronics society annual CONference (IECON), Florence, Italy, October 24-26, 2016.
- 9th IFAC Symposium on Biological and Medical Systems (BMS), Berlin, Germany, August 31-Sept. 2, 2015

#### Presentation to national conferences/workshops

- Annual Conference of the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.), virtual conference (Catania), September 8-10, 2023.
- Annual Conference of the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.), virtual conference (Cagliari), September 9-11, 2022.
- Annual Conference of the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.), Ancona, Italy, September 11-13, 2019.
- Annual Conference of the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.), Florence, Italy, September 12-14, 2018.
- Annual Conference of the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.), Milan, Italy, September 11-13, 2017. **Second place for best poster presentation.**
- Annual Conference of the Italian Society of Teachers and Researchers in Automatic Control (S.I.D.R.A.), (Attendance), Bergamo, Italy, September 8-10, 2014.

#### PUBLIC ENGAGEMENT ACTIVITIES

- *Artificial intelligence: support or obstacle to creativity?*. Event: Artificial Intelligence, opportunities and risks. Organizers: Department of Management Engineering, of Information and Production of the University of Bergamo in collaboration with the “Ateneo di Scienze Lettere e Arti” of Bergamo, 27 March 2024, Bergamo (Italy).

#### PERSONAL SKILLS AND COMPETENCES

##### Languages

Italian (Mother tongue), English (C1 level).

##### Computer skills

C, C++, Java, HTML, CSS, Visual Basic, C#, Python, R, MatLab, Simulink, LabView, Arduino, Git, CANalyzer, Scikit-learn, Keras, Office suite, LaTeX, basics of Siemens PLC.

##### Sports

Futsal, Tennis.

##### Artistic skills and competences

Guitar, Trombone, Saxophone, musical composition and arrangement.

##### Driving licence

Car license.

## PUBLICATIONS

## International journals

- [J19] M. MAZZOLENI  
*Design of supervision solutions for industrial equipment: Schemes, tools and guidelines for the user.*  
Journal of Industrial Information Integration, vol. 41, pp. 100667 (23 pages), 2024. DOI: 10.1016/j.jii.2024.100667.
- [J18] L. Maurelli, M. MAZZOLENI, A. Camisani, F. Previdi  
*Physics-informed Remaining Useful Life estimation of cost-effective solenoid valves using significant points of the excitation current.*  
ASME Journal of Dynamic Systems, Measurement and Control, vol. 146, n. 3, pp. 031007 (11 pages), 2024. DOI: 10.1115/1.4064602.
- [J17] D. Previtali, M. MAZZOLENI, A. Ferramosca, F. Previdi  
*GLISp-r: A preference-based optimization algorithm with convergence guarantees.*  
Computational Optimization and Applications, vol. 86, pp. 383-420, 2023. DOI: 10.1007/s10589-023-00491-2.
- [J16] D. Campos, A. Carrasco-Muñoz, M. MAZZOLENI, A. Ferramosca, A. Luque.  
*Screening of Machine Learning Techniques on Predictive Maintenance: a Scoping Review.*  
DYNA, vol. DYNA-ACELERADO(0). DOI: 10.6036/10950.
- [J15] A. Luque, M. MAZZOLENI, F. Zamora-Polo, A. Ferramosca, J. R. Lama and F. Previdi  
*Determining the Importance of Physicochemical Properties in the Perceived Quality of Wines.*  
IEEE Access, vol. 11, pp. 115430-115449, 2023. DOI: 10.1109/ACCESS.2023.3325676.
- [J14] P. Boni, M. MAZZOLENI, F. Previdi  
*Robust data-driven design of a jamming detection filter for airborne electromechanical actuators.*  
European Journal of Control, pp. 100926, 2023. DOI: 10.1016/j.ejcon.2023.100926.
- [J13] N. Valceschini, M. MAZZOLENI, S. Formentin, F. Previdi  
*Data-driven mixed-sensitivity control with automated weighting functions selection.*  
International Journal of Robust and Nonlinear Control, 2023. DOI: 10.1002/rnc.6579.
- [J12] M. MAZZOLENI, K. Sarda, A. Acernese, L. Russo., L. Manfredi, L. Glielmo, C. Del Vecchio  
*A fuzzy logic-based approach for fault diagnosis and condition monitoring of industry 4.0 manufacturing processes.*  
Engineering Applications of Artificial Intelligence, vol. 115, pp. 105317, 2022. DOI: 10.1016/j.engappai.2022.105317.
- [J11] M. MAZZOLENI, A. Chiuso, M. Scandella, S. Formentin, F. Previdi  
*Kernel-based system identification with manifold regularization: a Bayesian perspective.*  
Automatica, vol. 142, pp. 110419, 2022, ISSN: 0005-1098. DOI: 10.1016/j.automatica.2022.110419.
- [J10] A. Cattaneo, A. Vitali, M. MAZZOLENI, F. Previdi  
*An agent-based model to assess large-scale COVID-19 vaccination campaigns for the Italian territory: the case study of Lombardy region.*  
Computer Methods and Programs in Biomedicine, vol. 224, pp. 107029, 2021, ISSN: 0169-2607. DOI: 10.1016/j.cmpb.2022.107029.
- [J09] A. Luque, M. MAZZOLENI, A. Carrasco, A. Ferramosca  
*Visualizing Classification Results: Confusion Star and Confusion Gear.*  
IEEE Access, vol. 10, pp. 1659-1677, 2022. DOI: 10.1109/ACCESS.2021.3137630.
- [J08] M. MAZZOLENI, G. Maroni, S. Formentin, F. Previdi  
*A kernel-based control approach for multi-period assets allocation based on lower partial moments*  
Engineering Applications of Artificial Intelligence, vol. 110, 2022, ISSN 0952-1976. DOI: 10.1016/j.engappai.2021.104659.
- [J07] N. Valceschini, M. MAZZOLENI, F. Previdi  
*Inertial load classification of low-cost electro-mechanical systems under dataset shift with fast end of line testing.*  
Engineering Applications of Artificial Intelligence, vol. 105, ISSN 0952-1976, 2021. DOI: 10.1016/j.engappai.2021.104446.
- [J06] M. Scandella, M. MAZZOLENI, S. Formentin, F. Previdi  
*Kernel-based identification of asymptotically stable continuous-time linear dynamical systems.*  
International Journal of Control, 2020. DOI: 10.1080/00207179.2020.1868580.
- [J05] M. Scandella, M. MAZZOLENI, S. Formentin, F. Previdi  
*A note on the numerical solutions of kernel-based learning problems.*  
IEEE Transactions on Automatic Control, 2019. DOI: 10.1109/TAC.2020.2989769.

- [J04] M. MAZZOLENI, M. Scandella, F. Previdi, G. Pispola  
*Data on the first endurance activity of a Brushless DC motor for aerospace applications.*  
Data in Brief, 2020. DOI: 10.1016/j.dib.2020.105153. ISSN: 2352-3409.
- [J03] M. MAZZOLENI, M. Scandella, F. Previdi, G. Pispola  
*Experimental development of a Health Monitoring method for Electro-Mechanical Actuators of flight control primary surfaces in More Electric Aircrafts.*  
IEEE Access, 2019, vol. 7, pp. 153618-153634. DOI: 10.1109/ACCESS.2019.2948781. ISSN: 2169-3536.
- [J02] S. Formentin, M. MAZZOLENI, M. Scandella, F. Previdi  
*Nonlinear system identification via data augmentation.*  
Systems & Control Letters, 2019. DOI: 10.1016/j.sysconle.2019.04.004. ISSN: 0167-6911.
- [J01] M. MAZZOLENI, F. Previdi, S. Bonfiglio  
*Classification algorithms analysis for brain-computer interface in drug craving therapy.*  
Biomedical Signal Processing and Control, 2019. DOI: 10.1016/j.bspc.2017.01.011. ISSN: 1746-8094.

## Books

- [B02] M. MAZZOLENI, G. Di Rito, F. Previdi  
*Electro-Mechanical Actuators for the More Electric Aircraft: Condition Monitoring and Fault Diagnosis applications.*  
In Advances in Industrial Control, Springer International Publishing, 2021, ISBN-13: 978-3-030-61799-8, DOI: 10.1007/978-3-030-61799-8.
- [B01] M. MAZZOLENI  
*Learning meets control: data analytics for dynamical systems*  
Bruno Mondadori editor, 2018, ISBN-13: 978-8867741632

## International conferences

- [C41] P. A. Mongini, M. MAZZOLENI, A. Ferramosca, L. Magni, C. Toffanin  
*A meal detection approach based on parity space to detect untreated meals in subjects with Type 1 diabetes.*  
63rd IEEE Conference on Decision and Control (CDC), Milan, Italy, 2024.
- [C40] G. Sonzogni, M. MAZZOLENI, M. Polver, A. Ferramosca, F. Previdi  
*An explicit expression of the steady-state error in Smith Predictor applied to linear systems with integral action.*  
18th IFAC Workshop on Time Delay Systems (IFAC TDS), Udine, Italy, 2024.
- [C39] F. Corrini and M. MAZZOLENI and F. Ferracuti and L. Cavanini and F. Previdi  
*An information theory approach for recursive LPV-ARX model identification via LS-SVM.* 20th IFAC Symposium on System Identification (SYSID), Boston, USA, 2024.
- [C38] M. MAZZOLENI and L. Maurelli and S. Formentin and F. Previdi  
*A comparison of indirect and direct filter designs from data for LTI systems: the effect of unknown noise covariance matrices.* 20th IFAC Symposium on System Identification (SYSID), Boston, USA, 2024.
- [C37] D. Cesani, M. MAZZOLENI, F. Previdi  
*The scenario approach for data-driven prognostics with application to bearings data.* 12th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes, (SAFEPROCESS), Ferrara, Italy, 2024.
- [C36] D. Cesani, M. MAZZOLENI, F. Previdi  
*Leak detection for household pipelines based on a smart valve with single pressure and flow sensors.* 12th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes, (SAFEPROCESS), Ferrara, Italy, 2024.
- [C35] P. Boni, M. MAZZOLENI, R. Sala, F. Pirola, F. Previdi  
*Identification of relevant symptoms of performance degradation in industrial machines.* 12th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes, (SAFEPROCESS), Ferrara, Italy, 2024.
- [C34] G. Sonzogni, M. MAZZOLENI, M. Polver, A. Ferramosca, F. Previdi  
*Notch filter design with stability guarantees for mechanical resonance suppression in SISO LTI two-mass drive systems.* 62nd IEEE Conference on Decision and Control (CDC), Marina Bay Sands, Singapore.
- [C33] M. MAZZOLENI, N. Valceschini, F. Previdi  
*Model Uncertainty-Aware Residual Generators for SISO LTI Systems Based on Kernel Identification and Randomized Approaches.* 62nd IEEE Conference on Decision and Control (CDC), 2023.
- [C32] M. Polver, A. Ferramosca, B. Sonzogni, M. MAZZOLENI, F. Previdi  
*Artificial Pancreas under a Zone Model Predictive Control based on Gaussian Process models: toward the personalization of the closed loop.* 22nd IFAC World Congress (IFAC WC), Yokohama, Japan, IFAC-PapersOnline 56 (2), pp. 9642-9647, 2023. DOI: 10.1016/j.ifacol.2023.10.271.

- [C31] L. Pitturelli, M. MAZZOLENI, F. Previdi  
*FRAN-X: An improved diagnostic transfer learning approach with application to ball bearings fault diagnosis.* 22nd IFAC World Congress (IFAC WC), Yokohama, Japan, IFAC-PapersOnline 56 (2), pp. 7716-7721, 2023. DOI: 10.1016/j.ifacol.2023.10.1175.
- [C30] M. MAZZOLENI, M. Scandella, F. Previdi  
*Evaluation of robust sensors placement schemes for leaks isolation in water distribution networks.* 2nd IFAC Workshop on Control Methods for Water Resource Systems (CMWRS), IFAC-PapersOnline 55 (33), pp. 48-53, 2022. DOI: 10.1016/j.ifacol.2022.11.008.
- [C29] N. Valceschini, M. MAZZOLENI, L. Pitturelli, S. Salvi, M. Rinaldi, F. Previdi  
*Experimental fault detection of input gripping pliers in bottling plants.* 11th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes, Pafos, Cyprus, IFAC-PapersOnline 55 (6), pp. 778-783, 2022. DOI: 10.1016/j.ifacol.2022.07.221.
- [C28] N. Valceschini, M. MAZZOLENI, L. Pitturelli, S. Salvi, M. Rinaldi, F. Previdi  
*Model-based fault diagnosis of sliding gates electro-mechanical actuators transmission components with motor-side measurements.* 11th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes, Pafos, Cyprus, IFAC-PapersOnline 55 (6), pp. 784-789, 2022. DOI: 10.1016/j.ifacol.2022.07.222.
- [C27] M. Polver, F. Previdi, M. MAZZOLENI, A. Zucchi  
*A SIAT3HE Model of the COVID-19 Pandemic in Bergamo, Italy.* 11th IFAC Symposium on Biological and Medical Systems, Ghent, Belgium, IFAC-PapersOnline 54 (15), pp. 263-268, 2022. DOI: 10.1016/j.ifacol.2021.10.266.
- [C26] K. Sarda, A. Acernese, L. Russo, M. MAZZOLENI  
*A comparison of envelope and statistical analyses for bearing diagnosis in hot steel rolling mill lines.* 47th IEEE Annual Conference of the IEEE Industrial Electronics Society (IECON), Toronto (virtual), pp. 1-6, 2021. DOI: 10.1109/IECON48115.2021.9589440.
- [C25] M. MAZZOLENI, M. Scandella, S. Formentin, F. Previdi  
*Nonparametric continuous-time identification of linear systems: theory, implementation and experimental results.* 1st IFAC Modeling, Estimation and Control Conference (MECC), Austin, TX (virtual), IFAC-PapersOnLine 54 (20), pp. 699-704, 2021. DOI: 10.1016/j.ifacol.2021.11.253.
- [C24] M. MAZZOLENI, V. Breschi, S. Formentin  
*Piecewise nonlinear regression with data augmentation.* 19th IFAC Symposium on System Identification (SYSID), Padova (virtual), Italy, July 13-16, IFAC-PapersOnLine 54 (7), pp. 421-426, 2021. DOI: 10.1016/j.ifacol.2021.08.396.
- [C23] L. Maurelli, M. MAZZOLENI, F. Previdi  
*Modeling and simulation of bimetallic strips in industrial circuit breakers.* 19th IFAC Symposium on System Identification (SYSID), Padova (virtual), Italy, July 13-16, IFAC-PapersOnLine 54 (7), pp. 803-808, 2021. DOI: 10.1016/j.ifacol.2021.08.460.
- [C22] M. MAZZOLENI, M. Scandella, S. Formentin, F. Previdi  
*Black-box continuous-time transfer function estimation with stability guarantees: a kernel-based approach.* Proceedings of Machine Learning Research vol 120:1-10, 2nd Learning for dynamics and control conference (L4DC), University of California, Berkeley, CA, June 10-11th, 2020.
- [C21] M. MAZZOLENI, M. Scandella, S. Formentin, F. Previdi  
*Enhanced kernels for nonparametric identification of a class of nonlinear systems.* 18th EUCA European Control Conference (ECC), San Petersburg, Russia, May 12-15, pp. 540-545, 2020. DOI: 10.23919/ECC51009.2020.9143785.
- [C20] D. Previtali, N. Valceschini, M. MAZZOLENI, F. Previdi  
*Identification of dynamic textures using Dynamic Mode Decomposition.* 21st IFAC World Congress, Berlin, Germany, July 12-17, IFAC-PapersOnLine 53 (2), pp. 2423-2428, 2020. DOI: 10.1016/j.ifacol.2020.12.045.
- [C19] M. MAZZOLENI, M. Scandella, F. Previdi  
*KBERG: A MatLab toolbox for nonlinear kernel-based regularization and system identification.* 21st IFAC World Congress, Berlin, Germany, July 12-17, IFAC-PapersOnLine 53 (2), pp. 1231-1236, 2020. DOI: 10.1016/j.ifacol.2020.12.1340.
- [C18] M. MAZZOLENI, M. Scandella, F. Previdi  
*Mechatronics applications of condition monitoring using a statistical change detection method.* 21st IFAC World Congress, Berlin, Germany, July 12-17, IFAC-PapersOnLine 53 (2), pp. 92-97, 2020. DOI: 10.1016/j.ifacol.2020.12.100.
- [C17] M. MAZZOLENI, M. Scandella, S. Formentin, F. Previdi  
*A comparison of manifold regularization approaches for kernel-based system identification.* 13th IFAC Workshop on Adaptive and Learning Control Systems, Winchester, United Kingdom, IFAC-PapersOnLine 52 (29), pp. 180-185, ISSN: 2405-8963, 2019. DOI: 10.1016/j.ifacol.2019.12.641.

- [C16] M. MAZZOLENI, M. Scandella, S. Formentin, F. Previdi  
*Classification of light charged particles via learning-based system identification.*  
57th IEEE Conference on Decision and Control, Miami Beach (FL), USA, pp: 6053-6058,  
ISBN: 978-1-5386-1395-5, 2018. DOI: 10.1109/CDC.2018.8618946.
- [C15] F. Previdi, Y. Maccarana, M. MAZZOLENI, M. Scandella, G. Pispola, N. Porzi  
*Development and Experimental Testing of a Health Monitoring System of Electro-Mechanical Actuators for Small Airplanes.*  
26th Mediterranean Conference on Control and Automation (MED), Zadar, Croatia,  
ISBN: 978-1-5386-7890-9, ISSN: 2473-3504pp: 673-678, 2018. DOI: 10.1109/MED.2018.8442734.
- [C14] M. MAZZOLENI, M. Scandella, Y. Maccarana, F. Previdi, G. Pispola, N. Porzi  
*Condition monitoring of electro-mechanical actuators for aerospace using batch change detection algorithms.*  
2nd IEEE Conference on Control Technology and Applications (CCTA), Copenhagen, Denmark,  
pp: 1747-1752, ISBN: 978-1-5386-7698-1, 2018. DOI: 10.1109/CCTA.2018.8511334.
- [C13] M. MAZZOLENI, M. Scandella, Y. Maccarana, F. Previdi, G. Pispola, N. Porzi  
*Condition assessment of electro-mechanical actuators for aerospace using relative density-ratio estimation.*  
18th IFAC Symposium on System Identification, Stockholm, Sweden, IFAC-PapersOnLine 51 (15), ISSN: 2405-8963, pp: 957 - 962, 2018. DOI: 10.1016/j.ifacol.2018.09.070.
- [C12] M. MAZZOLENI, M. Scandella, S. Formentin, F. Previdi  
*Identification of nonlinear dynamical system with synthetic data: a preliminary investigation.*  
18th IFAC Symposium on System Identification, Stockholm, Sweden, IFAC-PapersOnLine 51 (15), ISSN: 2405-8963, pp: 622-627, 2018. DOI: 10.1016/j.ifacol.2018.09.227.
- [C11] M. MAZZOLENI, S. Formentin, M. Scandella, F. Previdi  
*Semi-supervised learning of dynamical systems: a preliminary study.*  
16th European Control Conference (ECC), Limassol, Cyprus, ISBN: 978-3-9524-2698-2, 2018.  
DOI: 10.23919/ECC.2018.8550550.
- [C10] M. MAZZOLENI, G. Maroni, F. Previdi  
*Unsupervised learning of fundamental emotional states via word embeddings.*  
IEEE Symposium Series on Computational Intelligence (SSCI), Hawaii, USA, pp: 31 - 36, ISBN: 978-1-5386-2726-6,  
2017. DOI: 10.1109/SSCI.2017.8280819.
- [C09] M. MAZZOLENI, S. Formentin, F. Previdi, S.M. Savaresi  
*Control-oriented modeling of SKU-level demand in retail food market.*  
20th IFAC World Congress, Toulouse, France, IFAC-PapersOnLine 50 (1), pp: 13003 - 13008, ISSN: 2405-8963,  
2017. DOI: 10.1016/j.ifacol.2017.08.1951.
- [C08] M. MAZZOLENI, Y. Maccarana, F. Previdi  
*A comparison of data-driven fault detection methods with application to aerospace electro-mechanical actuators.*  
20th IFAC World Congress, Toulouse, France, IFAC-PapersOnLine 50 (1), ISSN: 2405-8963, pp: 12797 -  
12802, 2017. DOI: 10.1016/j.ifacol.2017.08.1837,
- [C07] M. MAZZOLENI, G. Maroni, Y. Maccarana, S. Formentin and F. Previdi  
*Fault detection in airliner electro-mechanical actuators via hybrid particle filtering.*  
20th IFAC World Congress, Toulouse, France, IFAC-PapersOnLine 50 (1), ISSN: 2405-8963, pp: 2860 - 2865,  
2017. DOI: 10.1016/j.ifacol.2017.08.640.
- [C06] M. MAZZOLENI, Y. Maccarana, F. Previdi, G. Pispola, M. Nardi, F. Perni, S. Toro  
*Development of a reliable electro-mechanical actuator for primary control surfaces in small aircrafts.*  
IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), Munich, Germany,  
ISBN: 978-1-5090-6000-9, ISSN: 2159-6255, pp: 1142 - 1147, 2017. DOI: 10.1109/AIM.2017.8014172.
- [C05] A. Cologni, M. MAZZOLENI, F. Previdi  
*Low computational complexity control of a three-phases open-windings AC brushless motor.*  
42nd IEEE Industrial Electronics society annual CONFERENCE (IECON), Florence, Italy, ISBN: 978-1-5090-3474-1,  
pp: 577 - 582, 2016. DOI: 10.1109/IECON.2016.7793011,
- [C04] A. Cologni, M. MAZZOLENI, F. Previdi  
*Modeling and identification of an Electro-Hydraulic Actuator.*  
12th IEEE International Conference on Control and Automation (ICCA), Kathmandu, Nepal,  
ISBN: 978-1-5090-1738-6, pp: 335 - 340, 2016. DOI: 10.1109/ICCA.2016.7505299.
- [C03] F. Previdi, M. MAZZOLENI, A. Cologni, M. Ermidoro  
*An application of the remote maintenance paradigm to semi-automated machines.*  
14th IMEKO TC10 Workshop on Technical Diagnostics, Milan, Italy, 2016, pp: 285 - 289.
- [C02] M. MAZZOLENI, F. Previdi  
*A Comparison of Classification Algorithms for Brain Computer Interface in Drug Craving Treatment.*  
9th IFAC Symposium on Biological and Medical Systems (BMS), Berlin, Germany, ISSN: 2405-8963,  
pp: 487 - 492, 2015. DOI: 10.1016/j.ifacol.2015.10.188.

- [C01] M. MAZZOLENI, S. Formentin, F. Previdi and S. M. Savaresi  
*Fault Detection via modified Principal Direction Divisive Partitioning and application to aerospace electro-mechanical actuators*. 53th IEEE Conference on Decision and Control (CDC), Los Angeles, USA,  
ISBN: 978-1-4673-6090-6, ISSN: 0191-2216, pp: 5770 - 5775, 2014. DOI: 10.1109/CDC.2014.7040292.

### Toolboxes

- [T01] M. MAZZOLENI, M. Scandella, F. Previdi  
*KBERG: A MatLab toolbox for nonlinear kernel-based regularization and system identification*.  
<https://cal.unibg.it/wp-content/uploads/papers/20210701-KBERG.7z>

### WAIVER

I authorize the treatment of my personal data in compliance with the Italian Legislative Decree 196/2003 and the article GDPR 679/16 - "European regulation on the protection of personal data".